behalf of the French Academy of Sciences, "vous l'étendez en la généralisant." But few men have united with the power to generalise such marvellous quickness and tenacity in working out detail. That quickness and tenacity may be estimated by the volume of his work. In his later life he had, of course, much help, but in his earlier years, when he often passed the night in the laboratory, he worked single-handed. Berthelot rejected until well into the nineties (as Bunsen did until his death) the use of the atomic notation, chiefly perhaps from a horror of the enthusiastic and somewhat uncritical faith of contemporaneous exponents of the atomic theory.

In person Berthelot was short and slight, and with the stoop of the student. In lecturing he spoke rapidly and in a low voice, with no attempt at oratorical effect. But his fine, regular features and brilliant blue eyes left an impression not easily to be forgotten. Reserved and almost cold in manner, he cared for two things supremely, his work and his family. He survived the shock of his wife's death, which took place on March 18, only by a few minutes.

The French Parliament voted a public funeral; it took place on Monday in the Panthéon, where the remains of his wife rest beside his own.

M. Berthelot left a daughter and four sons, of whom one, M. Daniel Berthelot, is well known for his researches in physical chemistry, and occupies a chair at the Ecole supérieure de pharmacie.

P. J. Hartog.

NOTES.

Men of science in this country will probably have to wait a long time before they will see the Government and the nation pay such a tribute to the greatness of one of their number as was witnessed in Paris on Monday, when the national funeral of M. and Mme. Berthelot took place at the Panthéon. Here politicians and people have little sympathy with intellectual greatness; and if M. Berthelot had lived in Great Britain instead of France his death would have been mourned by the world of science, but the Government would certainly not have hastened to secure for him the honour of a national funeral, because our statesmen do not know the influence of scientific work on national character and progress; and to them men of science live in a world, far beyond the range of practical politics, where virtue finds its own reward. To understand the right spirit of appreciation of a great man of science we have to cross the Channel, and be present at a funeral like that of M. and Mme. Berthelot; for on such an occasion the French manifest incomparable qualities of organisation and tact. From the report of the Paris correspondent of the *Times* we learn that not since the funeral of Ernest Renan have the population of the capital been invited to join the authorities in such a solemn demonstration of mourning for one of their great compatriots. Amid impressive surroundings all that is representative of the dignity of the State was assembled, from the President of the Republic to the members of the several academies, the council of the Legion of Honour, the Ministers, the members of Parliament, and a host of the most eminent personalities of France. After a portion of Beethoven's Symphony in C minor had been rendered, the Minister of Education, M. Briand, ascended a small platform erected near the academicians and read a funeral oration in which he worthily honoured the illustrious dead. Berthelot's attitude towards the religious sentiment he accurately summarised in the terms of a formula borrowed from Renan—"The real way of adoring God is to know and love what exists." Respecting Berthelot as a *savant*, he dwelt particularly on his *rôle* as a creator, the forerunner of more startling syntheses still. The great moral quality of the man, the natural consequence of his philosophical ideas, was tolerance. After the oration, the two coffins were carried to the peristyle of the Panthéon, where a monumental catafalque had been raised. A splendid military pageant followed, the troops defiling past the coffins to the strains of the "Chant du Départ" and "Les Girondins," while flags were lowered and swords raised in salutation of the dead. In the afternoon the public was allowed to visit the Panthéon, and in the evening the bodies were taken to the Panthéon vaults, where they occupy provisionally a place next to the remains of Victor Hugo.

Scientific men will do well to watch the course of events connected with the subject of Mr. Haffkine's prophylactic and the Mulkowal accident, referred to by Prof. Ross in last week's Nature, as it is important that laboratories engaged in making prophylactics and sera shall not be lightly discredited on inadequate evidence—important not only for the laboratories, but for the public, which in its alarm is led to reject these valuable agents. In the House of Commons on March 20, Mr. Morley gave a cautious written reply to a question by Sir W. Collins on the subject. He stated that Mr. Haffkine is still in the employment of the Government of India, and has been offered "employment in that country on research work at a salary equal to that of which he was in receipt when he left India." But it is understood that Mr. Haffkine is holding out, not for the loaves and fishes of office, but for the vindication of himself, his laboratory, and his science from what appears to have been at least a very doubtful verdict. Mr. Morley also stated, somewhat too cautiously, that "Dr. Haffkine's prophylactic continues to be one of the precautions which are recommended by Government to the general populations against outbreaks of plague." But this is quite an inadequate description of it. Mr. Morley appears to have overlooked the facts that in official statements other measures, such as segregation, disinfection, and evacuation, have been declared to be unavailing; that in the epidemic now raging in the United Province of Agra and Oudh, the Government of the province reported only last month (*Bombay Gazette*, February 18) to the effect that the prophylactic was the only measure affording real and substantial protection; and that in the Punjab alone, up to October, 1903, 1,327,075 people had been inoculated, with a declared reduction of mortality to about one-twelfth that occurring in the uninoculated (report on plague and inoculation in the Punjab by the chief plague medical officer, Lahore, 1904). But Mr. Morley may be trusted to see that justice (and, let us hope, something more) is done in this case.

Lord Kelvin, O.M., has been nominated as president-elect of the Institution of Electrical Engineers for the session 1907–8, his term of office as president to begin next November. Prof. J. J. Thomson has been elected an honorary member of the institution.

Lord Avebury will preside at the annual soirée of the Selborne Society, which will be held at the Civil Service Commission (Old London University), Burlington Gardens, on Friday, April 26. Illustrated addresses will be given, and there will be a display of microscopes and objects of interest.

A *Times* correspondent at Kingston, Jamaica, reports that earthquake shocks are recurring with alarming frequency, the latest being at 1.30 a.m. on March 25. All the shocks have been sharp, though short, and accompanied by loud subterranean rumblings.

THE *Pall Mall Gazette* states that Mr. Franz Herger, director of the Meteorological Observatory of the St. Gothard, was caught by a snowstorm while returning from the observation tower, and his dead body was found a few days ago, almost completely covered with snow, near the Lucendro Bridge.

THE seventy-ninth meeting of the German Association of Naturalists and Physicians will be held at Dresden on September 15–21. General meetings will be held on Monday, September 16, and Friday, September 20, at which lectures will be given by Profs. Hempel (Dresden), Hergesell (Strassburg), Hoche (Freiburg-im-Baden), and Strassen (Leipzig). The sections will meet on September 16, 17, and 18. There will be a section of geophysics, meteorology and terrestrial magnetism, and anyone desiring to give a short lecture or demonstration to the section should communicate before May 25 with Prof. Paul Schreiber, Direktor des K. Met. Instituts, Dresden-N. 6, grosse Meissner Strasse 15.

WE regret to see the announcement that Prof. E. von Bergmann, professor of surgery in the University of Berlin since 1882, died at Wiesbaden on Monday, March 25, in his seventy-first year. For a few years before his appointment to his Berlin chair and to the directorship of the University Clinical Hospital he was professor of surgery at Würzburg. An obituary notice in the *Times* records that in Berlin von Bergmann devoted himself to the development of Lord Lister's antiseptic methods, and became one of the leading exponents of the purely aseptic treatment which dispensed with the carbolic spray, and relied upon the prevention of infection by means of perfect cleanliness. His success was especially remarkable in operations upon the skull and the brain, and surgery owes to him considerable advances in this particular department of its labours. After the death of Prof. Virchow, von Bergmann became the most eminent representative of the German medical world, and he was a present or a past president of the leading medical and chirurgical societies. Last year he was made a life member of the Upper House of the Prussian Diet. German and foreign universities honoured him by the bestowal of their academic degrees, and only last December he celebrated his seventieth birthday, and received tributes of admiration and esteem from the leading members of his profession at home and abroad.

THE motion for the second reading of the Weights and Measures (Metric System) Bill was defeated in the House of Commons on March 23 by a majority of 32, 118 voting for the second reading and 150 against. The Bill proposed that from April 1, 1910, or at a later date to be fixed by Order in Council, the standard metre and kilogram should be established, and that sales and contracts should thenceforth be made according to the metric system. Mr. Strauss, in moving the second reading, said that resolutions in favour of the Bill have been passed by the London County Council, large numbers of chambers of commerce, and many local authorities, and it is supported by the heads of many trade and engineering firms and numbers of trade unions. He asked the House to give the Bill a second reading for three reasons:—the loss of time and money in business and trade involved in the present system; the most serious waste of time in the education of children; and the loss of commerce with other countries owing to our dealing in weights and measures which to them are incomprehensible. The incongruities and absurdities of the cumbersome British units of weights and measures were exhibited by Mr. Strauss and Sir H. Norman, who seconded the motion, while the latter gave a convincing exposition of the simplicity and interdependence of the metric weights and measures.

THE opposition made out a strong case against the Metric System Bill referred to above. Mr. Haworth urged that 80 per cent. to 90 per cent. of the engineers of this country are against the Bill, and that it had been estimated that in engineering alone the cost of the change would be 100 million pounds. In shipping, measurements of draught, displacement, and tonnage, which are nearly universal on the British standard, would have to be altered throughout the world. The cotton trade, again, is carried on all over the world on the English measure. Similar cases were quoted by subsequent speakers, and it was also maintained that the greater part of our trade is with non-metric countries, and that unless the colonies and the United States adopted the change with us, few of the advantages offered by the metric system could be reaped. The metric system was legalised in Great Britain several years ago, and the manufacturers of the country can adopt it when they find it to their interest to do so. In commerce, as in science, it is desirable to secure international standards so far as possible, and the metric system has been adopted by many countries, and has become the basis of scientific measurements, because it provides simple and satisfactory standards. An international system of weights and measures may be as impracticable as an international language, but the advantages of either of these common means of expression are obvious. When traders and manufacturers find that the metric system must be adopted in order to have commercial relations with other countries, they will no doubt adapt themselves to the new circumstances. Until some common agreement has been arrived at among leading business men, it can scarcely be urged that Parliament should make compulsory a system which would involve an industrial revolution.

THE anniversary dinner of the Chemical Society was held on March 22, Prof. Meldola, president of the society, being in the chair. Lord Rayleigh proposed the toast of "The Chemical Society," and he is reported to have said, in the course of his remarks, that an ardent student, if he is so disposed, can become the parent of a new substance. Others of maturer age look upon this increase of the chemical population as rather an embarrassment. No doubt there is a multitude of details, and one can only hope that in the course of time generalisation may arise and be established which will supersede much of that detail, link it together, and so render it no longer so serious a burden upon the memory. In replying to the toast, Prof. Meldola said in its intimate relations with other branches of science chemistry is as far-reaching, as cosmopolitan, has as many points of contact with all branches of science, organic or inorganic, as any branch of science that is being cultivated at the present time. He expressed regret at the enormous wastage of chemical talent and faculty going on all over this country, and said the society could do very much if it had larger resources to fall back upon. The research fund should be in such a position that the society could afford to give personal grants to workers to enable them to secure the services of competent men to cooperate with them in their work. The toast of "Scientific Societies" was proposed by Sir

William Ramsay, and responded to by Lord Kelvin and Prof. Ray Lankester. Prof. Lankester agrees that there is a need for great endowments for furthering chemical science, and, indeed, the various departments of the whole scientific field, and that if learned societies make it known that they will administer those funds, the money will be forthcoming. He considers it would be better to give money in this way than that it should be given, say, to universities, which Prof. Lankester is unable to regard as promoters of scientific knowledge in this country. Sir A. Rücker, however, in responding to a later toast, said that he has cherished as part of his creed that the business of a university is not only to teach, but to add to knowledge. The Foreign Office and the Royal Society asked the University of London to undertake the establishment of a chair of protozoology, and it was done. As Prof. Lankester acted as the adviser of the Royal Society in this matter, Sir Arthur Rücker thought the action was proof enough that he really believed in research by a university.

IN an article on the evolution of the horse family, published in the March number of the *American Journal of Science*, Mr. R. S. Lull gives a series of diagrams illustrating the differences in relative size and form of the various generic types. When referring to the suggestion that the one-toed Siwalik hipparion may be the ancestor of the zebras, the author is oblivious of the view that the latter form a mixed group, one of the members of which is closely allied to the wild ass. A paper by Mr. C. W. Gilmore, on a new species of the ichthyosaurian genus Baptanodon from Wyoming, is also included in the same issue.

THE fifth annual report of the Philippine Bureau of Science (published at Manila in 1906) shows that the society did excellent work during the twelvemonth under review, although its efforts were considerably hampered for lack of sufficient accommodation. Special attention was directed to the prevention of cholera by means of cholera vaccine. Although eradication of the disease seems impracticable, it appears to be a fact that the vaccine confers a blood-immunity greater than that resulting in the case of typhoid by the use of typhoid vaccine, and it is considered that vaccination will prove of even greater value in the case of cholera than it is in that of typhoid.

A MODEL of the restored skeleton of the horned dinosaur *Triceratops prorsus*, duplicated from one in the U.S. National Museum at Washington, has just been set up in the reptile gallery in the Natural History Museum. The original bones upon which the restoration is based were obtained from the Laramie beds (Upper Cretaceous) of Converse County, Wyoming. Another addition to the collection of very considerable interest is a specimen of the slughi (or gazelle-hound) of the eastern deserts, the gift of the Hon. Florence Amherst. The special interest attaching to these dogs (also known as Syrian or Persian greyhounds) is that they belong to the same type as one represented in the tombs of Beni Hasan, and are thus the oldest breed in existence. The best strains are in the possession of the Bedouin chiefs, from one of whom the specimen presented by Miss Amherst was obtained.

CONSIDERABLE interest attaches to the exhibition in the entrance hall of the Natural History Museum of a specimen of the tile-fish, *Lopholatilus chamaeleonticeps*, a species remarkable, not only for its brilliant coloration—perhaps unequalled by any other non-tropical fish—but for its curious history. The species first made its appearance off No Man's Land, Massachusetts, in 1879, when a specimen was taken in deep water on a cod-line. Soon after it could be taken in abundance with the same kind of apparatus, a catch of some 250 lb. of fish (ranging individually from 10 lb. to 40 lb.) in the course of a couple of hours or less being not uncommon. This raised the hopes of fishermen, and in the U.S. Fishing Report for 1881 it was stated that "there is every reason to believe that the tile-fish will rank among the most important food-fishes of the United States." About the time (1882) that New English fishermen were getting into the swing of the fishing the tile-fish, owing to ice in the Atlantic, disappeared as suddenly as it came, and it is only during the last fifteen years that it has re-visited the American Atlantic coast, where it can now be taken at a depth of about seventy fathoms.

THE commission appointed for the investigation of Mediterranean fever has issued part v. of its report. Staff-Surgeon E. A. Shaw, R.N., shows by experiments on monkeys that infection is possible through the eyes, nose, and digestive tract by means of infected dust and food, and through scratches and wounds by the urine of patients. The possibility of infection by unlimited contact is also demonstrated. The same investigator shows that the *M. melitensis* produces little toxin, and he has failed to obtain a curative serum of much potency, and experiments by Dr. Eyre confirm the latter. A preventive vaccine was prepared which seemed to possess considerable immunising powers. Major Horrocks, R.A.M.C., discusses the occurrence of Mediterranean fever in Gibraltar, and shows that its incidence there, as in Malta, is probably largely dependent on goats. Dr. Eyre contributes a bibliography of the disease from 1897 to 1907.

AMONG the botanical papers included in the Proceedings of the Indiana Academy of Science, 1905, Mr. W. J. Young communicates an account of the embryology of *Melilotus alba*, stating that the megaspore mother-cell forms the embryo sac without undergoing division, and that a portion of the endosperm functions as a haustorium. Mr. G. W. Wilson enumerates the rust fungi with host plants recorded from Hamilton and Marion counties; species of Dicæoma attacking cereals, and *Gymnoconia interstitialis* infesting the blackberry bushes, were the most injurious. A description of the Leesburg Swamp and the plant associations occurring there is furnished by Mr. W. Scott.

AN account of experiments to determine the effect of stimulating organisms with different light rays is communicated by Prof. E. Hertel to *Naturwissenschaftliche Wochenschrift* (February 10). Two contingencies have to be taken into account; first, allowance must be made for the disparity in the intensity of the rays, and, secondly, the effect of stimulation will vary with the absorbent capacity of the organism for rays of varying wave-length. When a method was applied for equalising the intensity of the different rays, the physiological effect was found to decrease from the red to the blue rays, but since the absorption of the rays by living tissue also varied in the same way, the conclusion is evolved that the effect of light does not vary with the wave-length.

A SECOND paper on *Termes gestroi*, the white ant that is becoming a pest of considerable importance to the Hevea rubber trees in Tenasserim, is contributed by Mr. E. P. Stebbing to the *Indian Forester* (January). The curious accumulations of rubber in the nests have given rise to some discussion. The explanation put forward by the discoverer, that the termites are concerned with these accumulations, has not received acceptance, and it has been suggested that they are due to natural exudation. Meantime, analysis has shown that the rubber is purer than the best ordinary latex, and thus the matter stands. On the subject of fire in teak forests, Mr. H. Rodger presents a note accompanied by illustrations representing probable stages in the destruction of the teak trees.

THE fifth supplement to the first volume of the *Philippine Journal of Science* is appropriated to an enumeration of the Philippine grasses. The author has revised the lists of Blanco, F. Villar, and other previous compilers to exclude doubtful species; he has also drawn up short keys for the identification of tribes, genera, and species. With regard to geographical distribution, one-fifth of the species is endemic, including the monotypic genus *Garnotiella philippinensis*; there is a pronounced affinity with the grasses of the Malayan and Indo-Malayan regions, and a fair sprinkling of Australian types. The determination of the bamboos is uncertain, but the author records a new species of Gigantochloa.

DISCUSSING the mechanical development of the German iron industry in a copiously illustrated article in the *Engineering Magazine* (vol. xxxii., No. 6), Mr. J. H. Cuntz shows that the three important factors which now make for economy are by-product coking, the utilisation of furnace gases in the gas engine, and advanced practice in electric driving of winding and rolling-mill engines.

THE bridge at the Victoria Falls of the River Zambezi was described in detail by Mr. G. A. Hobson in a paper read before the Institution of Civil Engineers on March 19. Several types of bridges were considered, but the nature of the situation made it obvious that a two-hinged spandrel-braced arch was the one that most completely answered the requirements of the case. The bridge consists of three spans. The end span, on the left bank, is 62½ feet and the other 87½ feet, while the central span is 500 feet between the centres of the bearings, with a rise of 90 feet. The entire bridge, with the exception of the main bearings, weighs 1500 tons. The engineering interest which attaches to the execution of this work is due in a large measure to the remoteness of the site. The question of erection was considered of primary importance, and every detail was devised to simplify the procedure.

THE admirable work that is being done by the corps of mining engineers in investigating the mineral resources of Peru is clearly shown in the numbers of the *Boletin* of that body recently received. In No. 41 Mr. M. A. Denegri gives a report on the mineral production of Peru in 1905. The production included 75,338 tons of coal, 49,700 tons of petroleum, and considerable quantities of gold, silver, copper, lead, bismuth, nickel, mercury, salt, and borates. Excellently reproduced photographs accompanying the report indicate that in many cases the mines are well equipped. In No. 44 Mr. Carlos E. Velarde describes the mineral district of Huancavelica. The copper and silver veins are of considerable importance, and the Santo Domingo colliery furnishes an ample supply of coal for steam raising, whilst coke for smelting purposes can be abundantly obtained from the coal of the Oyon collieries, thirty miles distant from Huancavelica. In No. 45 Mr. G. I. Adams deals at length with the water supply of the provinces of Arequipa, Moquegua, and Tacna. Lastly, in No. 46 Mr. F. M. Santolalla describes the mineral resources of the province of Santiago de Chuco. The district is one of the richest in Peru, and its mining industry has a great future in store when better means of transport are provided by the projected extension of the railway from Menocucho to Salpo. The deposits existing in the province may be divided into the metalliferous veins in eruptive rocks, veins in sedimentary rocks, and the coal seams of Callacuyan, Chasamuday, Llaray, Hospital, and Angasmarca, all of which form part of the same coalfield.

THE admirable paper on petrol motor-omnibuses, read by Mr. W. Worby Beaumont before the Institution of Mechanical Engineers on March 15, forms a valuable contribution to the history of engineering, for there are few examples of rapid growth from the experimental stage to that of widespread practical importance so remarkable as that of the motor-omnibus. There is no example so instructive in possibilities as the adaptation of the high-speed, high-power, light-weight petrol prime-mover to the heavy work of the operation of the motor-omnibus on common roads. Barely four years have passed since the first petrol-propelled motor-omnibus may be said to have been regularly worked in public service in England, and within the last two years the number in London has increased from a few small vehicles to 795 in actual commission. These are carrying about 185 million passengers per year, and run from 90 to 120 miles per day, or 30,000 to 40,000 miles a year. There is great similarity in external design, but in the details of the mechanism and in the arrangement of the underframes there are considerable differences, which are clearly described by Mr. Beaumont and elucidated by the numerous excellent drawings to scale accompanying his paper. No standardisation in motor-omnibus construction can be expected for some time. The extraordinary mileage has accumulated much experience in a short time, but it has been very costly; and it must be admitted that, even with the finest material ever placed in the hands of the engineer, larger dimensions and greater surfaces are required to contend with the severe work of the present double-deck omnibus. Improvement may be looked for in the introduction of twenty-six-passenger in place of the present thirty-four-passenger vehicles. Then the weight of an omnibus may be materially reduced, and fuel and oil consumption and wear and tear also reduced, which, with a general observance of the legal speed-limit, will together add to the life and commercial efficiency of an omnibus. It is interesting to note that the cost of working a petrol motor-omnibus running 100 miles per day for 280 days per year may now be put as 9·56*d*. per mile, including depreciation at 20 per cent., while the average receipts per motor-omnibus mile in London exceed 13*d*.

WE have received from Washington a copy of the annual report of the Board of Regents of the Smithsonian Institution for the year ending June 30, 1905, together with a report of Mr. Richard Rathbun, the then acting secretary of the institution, for the year ending on June 30 last. Mr. Rathbun gives an account of the numerous activities of the institution during the year under review, and is able to record satisfactory progress. The general appendix of the regents' report contains, as usual, an admirable selection of papers by men of science of many nationalities, designed to furnish brief accounts of scientific discovery in particular directions. Among these papers we notice Sir William White's Friday evening address to the Royal Institution, on submarine navigation; Mr. G. T. Beilby's presidential address to the chemical section of the British Association at its South African meeting, on gold in science and industry; Sir Harry Johnston's paper to the Royal Geographical Society, on Liberia; as well as other contributions by British workers in science. The fine illustrations add greatly to the interest of the volume.

A THIRD edition of "A Text-book of Plant Diseases caused by Cryptogamic Parasites," by Mr. George Massee, principal assistant in the department dealing with cryptogams of the Royal Herbarium, Kew, has been published by Messrs. Duckworth and Co.

VOL. iv. of the Proceedings of the London Mathematical Society, second series, is now available. The volume is published by Mr. Francis Hodgson. Among its contents may be mentioned the records of proceedings at meetings of the society; obituary notices of the late Astronomer Royal of Ireland, Mr. C. J. Joly, F.R.S., and the late Mr. Robert Rawson, sometime headmaster of the Dockyard School, Portsmouth; papers published in the Proceedings from November, 1905, to November, 1906; and several useful indexes. Abstracts of papers brought before the society appear regularly among our reports of scientific societies and academies.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN APRIL:—

April 3. 5h. 48m. to 8h. 55m. Transit of Jupiter's Sat. III. (Ganymede).

7. 16h. 18m. to 17h. 1m. Moon occults γ Capricorni (mag. 3·8)

10. 9h. 55m. to 13h. 2m. Transit of Jupiter's Sat. III. (Ganymede).

13. 11h. 0m. Vesta in conjunction with the Moon (Vesta 0° 24′ N.).

,, 12h. 0m. Minimum of Algol (β Persei).

14. 16h. 0m. Mercury at greatest elongation (27° 36′ W.).

16. 8h. 49m. Minimum of Algol (β Persei).

18. 6h. 57m. Jupiter in conjunction with the Moon.

20–22. Epoch of Lyrid meteor-shower. Radiant 271°+33°.

21. 2h. 41m. Venus and Saturn in conjunction (Venus 0° 38′ N.).

,, Venus. Illuminated portion of disc=0·773.

30. 15h. 38m. to 16h. 50m. Moon occults ξ Ophiuchi (mag. 4·5).

COMET 1907*a* (GIACOBINI).—No further observations of this comet have yet been received, but the elements and daily ephemeris computed by Herr M. Ebell appear in No. 4161 of the *Astronomische Nachrichten* (March 13), the latter extending to March 31. An extract is given below:—

Ephemeris 12h. (M.T. Berlin).

1907		α (true) h. m.		δ (true) ° ′		log r		log Δ		Brightness
March 27	...	6 27·4	...	−3 34·3	...	0·3119	...	0·2474	...	0·67
29	...	6 24·9	..	−2 16·4						
31	...	6 22·7	...	−1 2·3	...	0·3122	...	0·2682	...	0·61

OBSERVATION OF COMET 1905 IV.—A telegram from the Kiel Centralstelle announces a further observation of comet 1905 IV. by Dr. Kopff at the Königstuhl Observatory on March 21. The position of the comet at 14h. 45·8m. (Königstuhl M.T.) was

R.A.=14h. 58·6m., dec.=21° 18′ S.,

and the magnitude was estimated to be 13·8.

The above position lies in the constellation Libra, and is above the horizon from about 11 p.m. to 6 a.m.

This comet was first discovered, as 1906*b*, by Dr. Kopff at Heidelberg on March 3, 1906, and was observed until June, 1906; the perihelion passage occurred on October 18, 1905. The orbit is remarkable for its great perihelion distance (3·3 R.), which has only been exceeded by that of the comet of 1729. The motion is probably parabolic, although an elliptic orbit, having a period of 1153 years, has been suggested.

STANDARD STELLAR MAGNITUDES.—In order that astronomers may have a ready means of reducing their magnitude observations to a uniform scale, Prof. Pickering publishes, in Circular No. 125 of the Harvard College Observatory, the positions and carefully determined photometric magnitudes of a selected sequence of stars in the region of the North Pole. To determine the magnitudes of other stars the following method is suggested:—Two photographs are taken, one of the polar region, the other of the region to be investigated, and on the former the standard stars, on the latter the stars the magnitudes of which are to be determined, are marked. Then on a night when the atmospheric conditions are good and constant, and at a time when the second region is at about the same altitude as the pole, a third plate is successively exposed for exactly the same time on each of the two regions.

Thus on the third plate the observer has the standard and unknown star-images on the same plate taken under exactly the same conditions, and may recognise them by superposing, in turn, the two negatives first secured and marking off the required images. These may then be compared for magnitude, and the results reduced to a standard scale by means of Prof. Pickering's standard list.

THE SPECTRUM AND RADIAL VELOCITY OF MIRA.—In No. 1, vol. i., of the Journal of the Royal Astronomical Society of Canada, Mr. J. S. Plaskett, of the Dominion Observatory, publishes the results of a spectrographic investigation of Mira during the most recent maximum. The spectra were obtained with a three-prism Brashear universal spectroscope giving a linear dispersion at Hγ of 18·6 tenth-metres per millimetre, and having a resolving power of 40,000. The results obtained by measuring two plates are in good agreement with one another and with the results obtained by Prof. Campbell and Mr. Stebbins. For the absorption lines a radial velocity of +65·6 km., reduced to the sun, was obtained, and as this is practically the value obtained by the other two observers mentioned, in 1897 and 1902, it appears that the receding motion of Mira in the line of sight is constant. The velocity, as determined from the bright hydrogen lines, is some 15 km. less, and Mr. Plaskett suggests that this difference is probably due to some abnormal conditions of pressure, temperature, or electrical state in the atmosphere of the star.

The present spectrograms show that titanium is undoubtedly represented in the spectrum of Mira, a point considered doubtful by Stebbins in 1902, and that the magnesium line at λ 4571, bright in 1902, is now represented by a normal absorption line; Hβ is fairly strong as a bright line, but Hϵ cannot be seen on these spectra.

TWO RAPIDLY-CHANGING VARIABLE STARS.—In No. 5 of the *Comptes rendus* M. J. Baillaud announced the discovery of two new variable stars of which the light changes were so rapid as to be shown on plates taken at the Paris Observatory with three successive exposures at intervals of half an hour. During the period of observation one of these stars changed from magnitude 14·5 to magnitude 12·7; the other changed from 14·5 to 13·6. As there are not likely to be many photographic images of these faint objects, they have been looked for on the Harvard photographs, and in Circular No. 126 Prof. Pickering publishes the information that has been gathered from thirteen plates.

A NEW ASTRONOMICAL JOURNAL.—We are pleased to be able to record that, with an increased grant from the Dominion Government, the Royal Astronomical Society of Canada has commenced the publication of a bi-monthly journal recording the proceedings of the society. The first number (January and February, 1907) contains information regarding the society and several very interesting papers. Among the latter may be mentioned two papers by Mr. Stupart on magnetic storms and auroræ, the president's address on the astronomical work of 1906, and a paper by Mr. Plaskett on the spectrum of Mira, referred to above.